PLANT RECORDS SYSTEM
SERVING AREA VALUE ENGINEERING
FOR RURAL SYSTEMS

CONTENTS

1. GENERAL

1.1 This section provides REA borrowers, consulting engineers and other interested parties with technical information covering an operational record system for the Serving Area Value Engineering design of rural telephone plant. In particular, it covers the following: (1) The serving area concept as compared with conventional plant design sometimes also identified as "Ready Access" or "Random Taper" designs; (2) The establishment of the serving area and the introduction of the serving area interface (SAI); (3) The consolidation of the interconnecting point (SAI) with the record activity at controlled points, thereby providing an orderly cross-connect point for station connects, disconnects and test purposes; (4) The introduction through SAVE of subscriber carrier and other pair gain equipment with less record requirements, and; (5) Numbering plans for use on feeder and distribution cables and identification of customer locations using the map and grid system. Along with

these discussions, a complete set of operational records are presented as one possible way in which the SAVE concept of cable plant design can be recorded. A short discussion is included about possible computer application to the system. The engineer will find additional helpful design and application information on the SAVE system in the following REA TE CM Sections:

TE CM Section & Addenda	Title
230	General Principles of Serving Value Engineering
231	Design Techniques for Serving Area Value Engineering
232	Transmission Design Considerations for Serving Area Value Engineering
629	Cable Plant Layout for SAVE
648	Serving Area Value Engineering (Physical Plant)

The serving area concept differs from conventional plant design in that basically a hard wire circuit is no longer necessarily "dedicated" from the MDF to the customer premise. Comments relating to the objectives and advantages of SAVE are thoroughly discussed in TE&CM Section 230. In addition, serving area design concepts, the establishment of serving areas and design strategy is also covered in detail in that section.

1.2 It is the purpose of this manual to offer guidelines in preparing plant facility records for the SAVE design of cable plant. This set of records has been formulated for the ultimate one party service; however, the same general information applies to the multi-party service as will be discussed later. The examples offered in this section of the manual comprise a complete and workable system of records. It is not the intent of REA, however, to dictate the format that a given company should use. Our objective is to point out the requirements of the SAVE record system and to offer guidelines in dealing with these requirements.

1.3 It is the position of REA that the best record system is one which incorporates daily operational needs and provides the necessary se and flexibility for plant additions, rearrangements, etc.

1.4 There are certain criteria needed in the orderly numbering and recording of plant and customer information. These needs are dealt with in this section of the manual. The exhibit(s) provide at least one way of implementing this criteria. First and of utmost importance, the design engineer should cooperate totally with the operating personnel during plant assignments. These assignments, including future SAI points and the prededication of feeder pairs, should be made for the longest practicable time and with the objective of making only minimal modifications to the original engineering design in the future. Secondly, it is imperative that the telephone company faithfully maintain the integrity of the assignments. Thirdly, and of equal importance, the installer-repairperson (IR) should make no change in the assignments without an engineering work order so that the long range integrity of the system can be assured. In this manner, all plant records can be properly posted to reflect the changes. It should be obvious that when carrier systems or concentrators are put into use, and when multi-party assignments are made, this has the effect of multiplying the number of entries normally required in the records. Accordingly, maintenance of and correct entries into the records become increasingly important. This point cannot be over emphasized.

2. ASSIGNMENT RECORDS

2.1 There are several functions of the assignment records, and each of these are dependent, to some extent, on the other. First, the record should show the "location of the plant." Roads, streams, lakes, subdivisions, houses, etc. should be shown and preferably drawn to scale. Second, the record should show "what is there." The cables should be identified and information about each individual pair such as where it originates, where it terminates, where it is loaded and how it is identified should be part of the record. Third, the record should show "how the facility that is there is being used." For instance, what central office equipment units are connected to each working cable pair at the CO end; what feeder pairs are connected to what distribution pair[illegible] the SAI; what pair gain devices are being used and what is the dr tion for each working pair, are examples. Fourth, without the fi three, the person responsible for line assignments would not be a perform the last function of the record system, that is, "to assi pairs for new service, for changes, or for rearrangements." Note reference made to various exhibits in this section are supported actual assignments.

3. DISCUSSION OF THE SYSTEM

3.1 The following is a list and a general discussion of the for supporting documents that comprise the complete one-party r system for the SAVE cable design. It is assumed that the princip

SAVE have been applied to this system and that the design is, in fact, completed. It may develop, in subsequent discussions, that combinations of design circumstances, to fit any individual situation, will not occur, and thus the records will not be totally comprehensive. It is intended, however, that these examples will be general enough that the principles will have wide application. The following comprise the record system under discussion:

1. Detail Map
2. Cable Schematic
3. The Primary Numbering Plan (MDF-Feeder)
4. The Secondary Numbering Plan (Distribution)
5. SAI Cross-Connect Record
6. The Customer Numbering Plan
7. Central Office Equipment Facility Records
8. Line and Station Card
9. Service Order
10. Supplemental Records
    a. Carrier/Concentrator Record
    b. Line Treatment Record

It should be understood that certain of the above examples will be shown to function better as construction records, others normally will function better as operational records while still others may serve a dual purpose. Keep in mind, however, that the primary intent of this section of the manual is to discuss a set or operational records developed to serve the day-to-day needs of the telephone company after the plant is cut over.

3.11 The Detail Map: The detail map functions in several ways. Street and subdivision information are included for one key purpose -- ease of plant location. Existing and potential residential, business, mobile home and other customer locations are also readily determined. Route numbering and SAI points are shown which tie in with the cable schematic. The same is true for wire and cable types and sizes. Existing and future serving areas can be included on this map. Existing and proposed plant can also be shown here. The detail map is attached as Exhibit A.

3.12 The Cable Schematic: The schematic could normally cover one or more serving areas, as can the detail map. Much essential information is found on the schematic that may or may not normally be found elsewhere in the record system. This depends of course upon the individual record system that is selected. (It is of interest here, in helping reduce the complexity of the entire record system, that a good deal of information appear on the schematic.) In addition to the physical layout of the cables, other information that is available or could be included is loading, cleared and capped pairs, pair counts, cable size, footages, carrier and concentrator terminals and locations, field mounted VFR's, customer number and

pair assignments, drop points, route numbering systems, housing sizes and types, transmission zone information, etc. Also, provisions could be included to show future serving areas, pre-dedicated pairs to the SAI's, etc. In some cases, it may be convenient to include the information contained on both the detail map and cable schematic on one form. This should be an individual judgement of course, depending on the needs of the telephone company, its engineer, the system complexity, etc. The cable schematic is attached as Exhibit B.

3.13 The Primary Numbering Plan (One Party Record) - Feeder: This plan establishes the MDF count by way of the cable schematic in this example and shows the routing, loading, pedestals, poles, SAI points and other pertinent information.

3.131 The single party cable record is used to record this count, customer assignment information for dedicated plant, and the count that appears as feeder pairs in each SAI. This record is attached as Exhibit C.

3.14 The Secondary Numbering Plan (SAI Cable Record) - Feeder/Distribution: This plan establishes an orderly numbering of the distribution count and may be somewhat repetitious at each SAI but in every case must be different from the primary count. For instance, we are on the primary cable route and cable designated "1" from the MDF enters the SAI designated "A". Leaving the SAI, there are four different distribution sheaths. We might number them DL1 A1, DL1 A2, DL1 A3, etc. In this case, they could each number A1 through AX, as required. The symbols DL are only included to demonstrate numbering system flexibility.

In the case, where both feeder (primary count) and distribution pairs (secondary), leave an SAI under the same sheath, a different numbering system is required. For example, assume that a 300 pair cable is leaving the field side of an SAI. Also assume that 100 pairs are feeders continuing on to the next SAI and the other 200 pairs are for distribution. The first 100 pairs (feeders) will retain the identification and count of the cable as it entered the SAI from the CO, or cable 1, MDF count 601-700 (1, 601-700). As the cable leaves the SAI, it will now have the following identification: 1,601-700 (feeders) and DL1 A1, 101-300 (distribution). This numbering system causes the first distribution pair to be on the first pair of the second hundred group in the cable and could be located at a customer pedestal with less chance for error than if a numbering system not addressing itself to the cable size were used.

3.141 In keeping with the idea that the SAVE design will defer a certain amount of plant investment by adding electronics rather than more cable, it is important that the design include expected future SAI points

and that the cable count intended for future feeders be assigned. In this manner, the expedient use of these pairs can be made so that when the future SAI is cut in, the field side of the feeders can be used as distribution pairs within the same serving area. The pedestal at that point should be an unequipped SAI housing.

3.142 The SAI record is used to show the location of the feeder pairs, the distribution pairs and auxiliary equipment (carrier, etc.), and to provide a way to cross reference the jumpering required to connect the customer to the COE. In this example, a single vertical, called frame 1 was used. Refer to Exhibit D for a sketch of how the housing address system is established. Twenty-five pair blocks numbered 1 to 18, top to bottom, were used along with the location of each pair called "BP" (Binding Post) on each block. In this case, blocks 1-3 were assigned feeder pairs and number frame 1, block 1, binding posts 1 through 25, frame 1, block 2, binding posts 1 through 25, etc. Block 4 was skipped for future use. Blocks 5 through 12 were assigned for distribution pairs numbering frame 1, block 5, binding posts 1 through 25 through frame 1, block 12, binding posts 1 through 25. Block 13 was assigned for carrier cross-connect assuming an external mounted station carrier.

The SAI records for purposes of examples in this section of the manual are Exhibits E (feeder) and F (distribution). Note that the "X to Dist BP and X to FDR BP" columns show the frame, block and binding post of the distribution pair that is assigned to a given feeder and vice versa. Also note that the "address" of a pair in this example is assigned by the identification: FRAME-BLOCK-BINDING POST, as Exhibit D explains. One method to account for high or low activity areas of the housing would be to prefix the above address with an appropriate symbol such as H, L, etc. In the case of a small low activity SAI, where blocks are not used, and conductors are hard wired, the cross-connect would simply show cable identifications and counts. In the case of station carrier or the use of concentrators, an auxiliary carrier/concentrator record is needed to show channel assignments and cross-connecting wiring. It may be that Exhibits E and F could be consolidated into one form. In any case, they should be laid out in such a way that would facilitate the easiest and quickest reference. For example, if the pages are laid out in book form, facing pages of records for comparable feeder and distribution count would be most convenient.

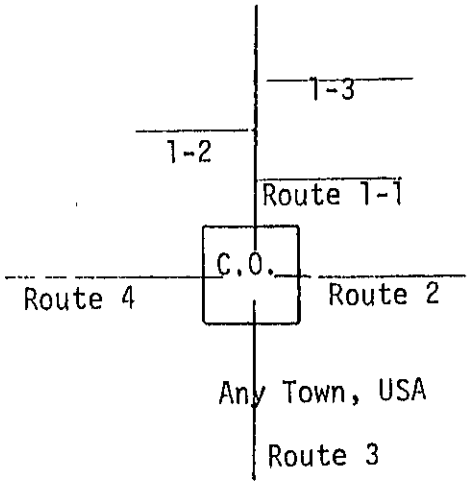
3.15 <u>The Customer Numbering Plan</u>: It is imperative that some logical numbering system be used to systematically number and locate the customer premises. In this example, we have chosen the MAP-GRID system in which the maps are keyed to townships, ranges and sections.

It is realized that parts of the United States do not use a system keyed in this manner. By using the central office as a key, however, a quadrant system could be superimposed on the map. A north-south and east-west line intersecting at the CO could identify the quadrant boundaries. Sections of the appropriate size to fit the map scale can be superimposed to the extent needed to cover the given exchange. These sections

would then be numbered. By using a suitably sized grid finder, the location of a customer could then be given the proper numerical assignment within this section. A customer map number might be quadrant A, section 21, location 6, or A-21-6.

3.151 Aside from giving a systematic approach to customer numbering, the MAP-GRID system allows the central recording point or consulting engineer to keep maps up-to-date by adding customers to a map from numerical assignments in the same geographical location as is found in the field.

3.152 As far as the cable routing information is concerned, the system of route numbers beginning with 1 on the north side of the CO, thence going 2, 3, etc., clockwise, is convenient. Sub-routes are numbered numerically from the main north-south, east-west lines depending on their establishment, distancewise, from the CO. The route numbering system is pictorially described as follows:



There are as many ways in which geographical customer numbering can be accomplished as there are for route numbering systems. For instance, Telephone Engineering and Construction Manual Section 116 could be referenced as another example of a route numbering system that is in current use. The route numbering system shown above fits in nicely with the MAP-GRID system discussed above for customer numbering, and thus is used here as an example.

3.153 It is not the purpose of this discussion to dictate what customer and route numbering plan must be used but to point out the importance of such plans. To simply number the customers or routes for

purposes of construction is not enough. The system must be logical, systematic and tabulated in such a way that the telephone company can carry out the assignments during normal operations.

3.16 Central Office Equipment Facility Records: The central office facility records can pretty much be used in the same format as they have been in the past. The increased number of stations and carrier systems will require records to facilitate maintenance. Also, with fine gauge cable, long line treatment will be expanded and a record of individual line treatment will be needed. Treatment on a CMO or CCO/G basis will be hard wired to the CO and not be made a part of the daily plant records. Examples of COE Facility Records' applications are attached as Exhibits G and H.

3.17 Line and Station Card: The line and station card has been expanded to show both the feeder and distribution assignments. This is important for maintenance. The card also contains space for the loop check method of testing. From a maintenance standpoint, this is an economical and effective test of the performance quality of a line. Other features that the card provides is space for recording data on customer owned equipment, on and off premise extensions, etc. The line and station card is attached as Exhibit J.

3.18 The Service Order: The plant copy of the service order is attached as Exhibit K. This form is basically discussed in REA Telephone Operations Manual Section 1440. For purposes of the SAVE concept, the service order has been expanded to include additional information. Provisions have been made to include MDF cable count, and address, the SAI identification, like information for the distribution cable and clarified details on the service location for the customer. Loading information includes the total of load points from the CO to the customer's residence.

3.19 Supplementary Records

3.191 Line Treatment Record: This record will function when either a loop extender or voice frequency repeater is used. The MDF cable pair will cross index to other appropriate forms such as the SAI and one-party record. Line equipment and terminal records can also be tied in with the line treatment. The line treatment record is attached as Exhibit L.

3.192 Carrier/Concentrator Record: An example of how to record the application of grouped, or distributed carrier is shown on the carrier records, Exhibits M1 and M2. The application of concentrators can be handled in somewhat the same manner. In order to reduce the quantity of cross-connect records, it is felt desirable to use hard wiring and tie cables wherever possible.

4. MULTI-PARTY APPLICATIONS

4.1 The SAVE concept is quite adaptable to multi-party service. As can be seen from the complexities of the one-party record system, the multi-party records will be more involved. It will be necessary to expand the cable assignment record, the SAI record and the carrier/concentrator record to provide space for accumulating customer information for all parties on a given pair or station carrier terminal. The line and station card will also need to be expanded in the same manner.

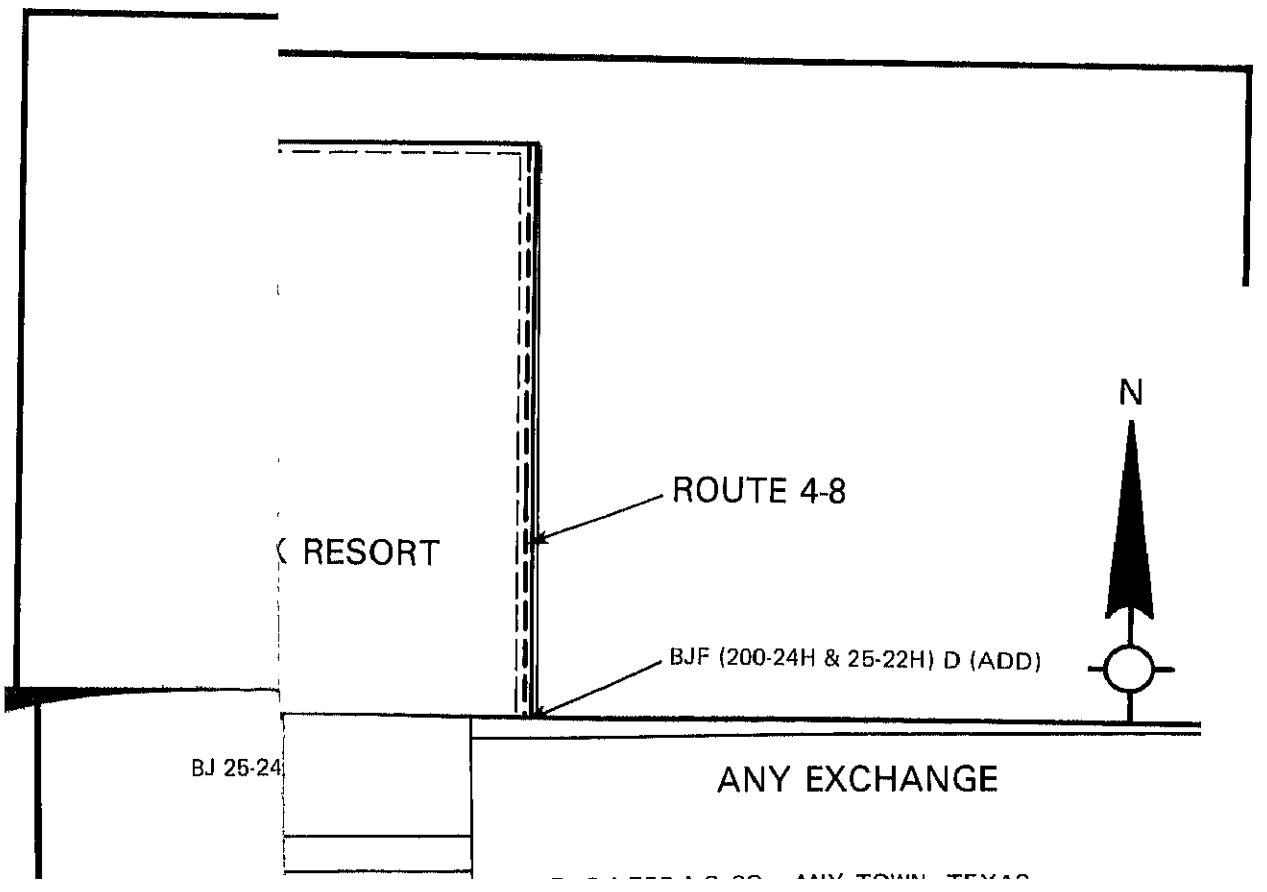
The cable and the SAI records perhaps could be restricted to map and telephone numbers in a directory type format using telephone number and map number as the key reference, followed by customer name, etc. The line and station card could be expanded to include multiple customers and be printed on both sides.

5. SYSTEM LAYOUT

5.1 System layout diagrams are attached as Exhibits N and O. It is the purpose of these diagrams to show typical interconnections in a telephone network, both with and without line treatment. These will be of assistance to the person preparing a set of records since various forms are referenced where entries should appear for any particular portion of a system.

6. THE COMPUTER

6.1 When the principles of SAVE are applied to plant design, it becomes necessary to expand record systems to accommodate the additional data entries that need to be made. This is an opportune time to consider the use of electronic data processing for keeping these records maintained and updated. Modifications resulting from SAVE that are made in record design, format, numbering systems, etc., should be carefully considered so that, if at some future time, the decision is made to use computer facilities, the changeover to such a system could be more easily facilitated.


N
ROUTE 4-8
RESORT
BJF (200-24H & 25-22H) D (ADD)
BJ 25-24
ANY EXCHANGE

ONE PARTY
CABLE RECORD

EXCHANGE Any

0 CABLE 1

MAP LINES _____ EXCHANGE _____

CABLE COUNT CABLE

EXHIBIT C

CABLE COUNT 401-425 CABLE 1 REA TE&CM 778 CABLE COUNT 426-450 CABLE 1

MAP LINES R4-8 EXCHANGE Any MAP LINES R4-8 EXCHANGE Any

	LOOP OHMS	LINE & TERM	L P	CONN. NO.	MAP NO.	CUSTOMER NAME	CA. PAIR	LOOP OHMS	LINE & TERM	L P	CONN. NO	MAP NO	CUSTOMER NAME
							426						
							427						
							428						
							429						
							430						
							431						
							432						
							433						
							434						
							435						
							436						
							437						
							438						
							439						
							440						
							441						
							442						
							443						
							444						
							445						
							446						
							447						
							448						
							449						
							450						

EXHIBIT C

CA. PAIR	LOOP OHMS	LINE & TERM	L P	CONN. NO.	MAP NO.	CUSTOMER NAME
451						
452						
453						
454						
455						
456						
457						
458						
459						
460						
461						
462						
463						
464						
465						
466		457			12-7	
467						
468						
469						
470						
471						
472						
473						
474						
475		408			12-6	

MAP LINES R4-8 EXCHANGE Any

CABLE COUNT 451-475 CABLE 1

CA. PAIR	LOOP OHMS	LINE & TERM	L P	CONN. NO.	MAP NO	CUSTOMER NAME
476						
477						
478						
479		392			12-5	
480						
481						
482						
483						
484						
485						
486						
487						
488						
489						
490						
491						
492						
493						
494						
495						
496						
497		382			12-4	
498						
499						
500						

MAP LINES R4-8 EXCHANGE Any

CABLE COUNT 476-500 CABLE 1

CABLE COUNT 501-525 CABLE 1 REA TE&CM 118 CABLE COUNT 526-550 CABLE 1

MAP LINES R4-8 EXCHANGE Any MAP LINES R4-8 EXCHANGE Any

PAIR	LOOP OHMS	LINE & TERM	L P	CONN. NO.	MAP NO.	CUSTOMER NAME	CA. PAIR	LOOP OHMS	LINE & TERM	L P	CONN. NO.	MAP NO.	CUSTOMER NAME
1						See SAI X	526						See SAI X
2							527						
3							528						
4							529						
5							530						
6							531						
7							532						
8							533						
9							534						
10							535						
							536						
							537						
							538						
							539						
							540						
							541						
							542						
							543						
							544						
							545						
							546						
							547						
							548						
							549						
							550						

EXHIBIT C

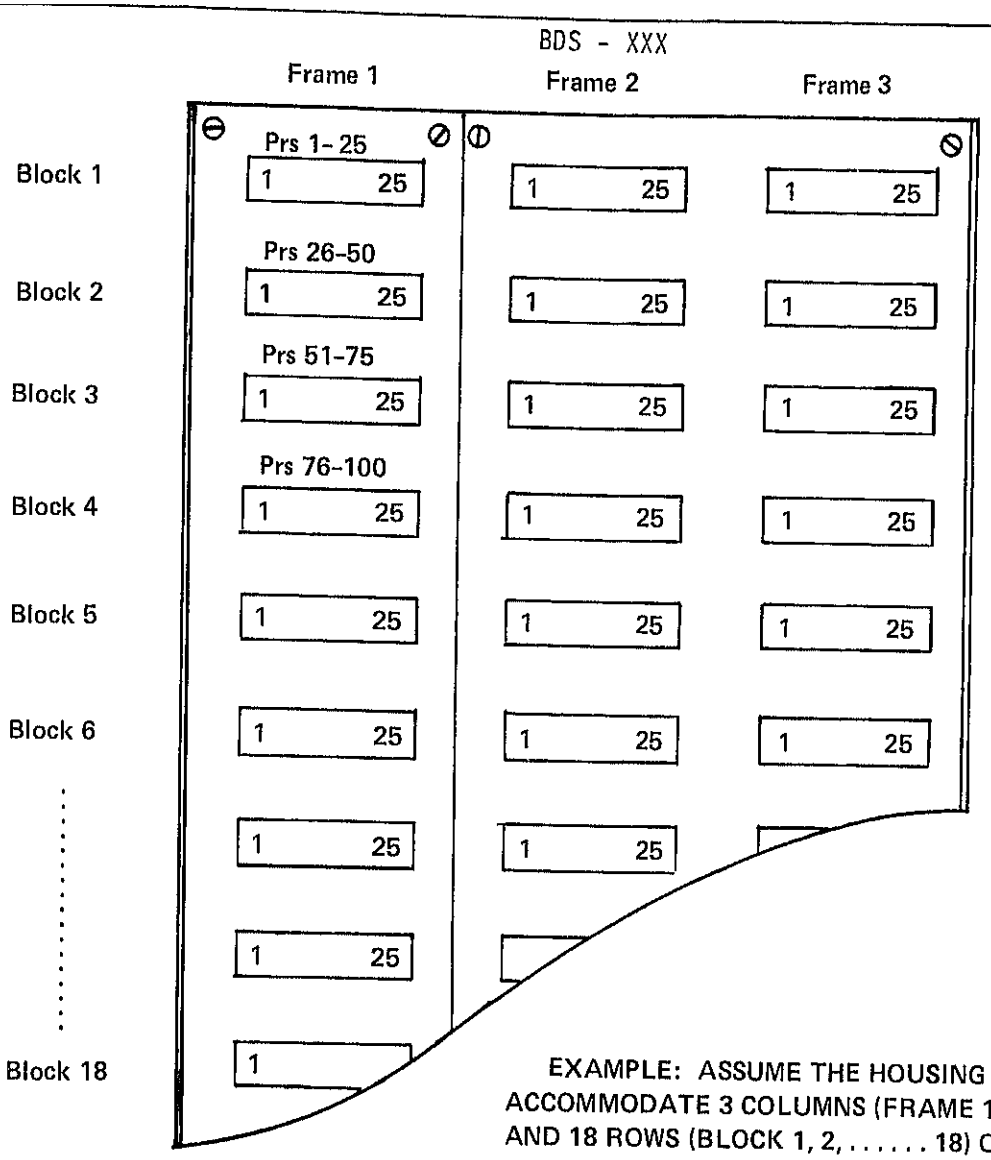
Sheet 2 of 2

CA. PAIR	LOOP OHMS	LINE & TERM	L P	CONN. NO.	MAP NO.	CUSTOMER NAME
51						See SAI X
52						
53						
54						
55						
56						
57						
58						
59						
50						
51						
52						
53						
4						
5						
6						
7						
8						
9						

CA. PAIR	LOOP OHMS	LINE & TERM	L P	CONN NO	MAP NO	CUSTOMER NAME
576						See SAI X
577						
578						
579						
580						
581						
582						
583						
584						
585						
586						
587						
588						
589						
590						
591						
592						
593						
594						
595						
596						
597						
598						
599						
600						

MAP LINES R4-8 EXCHANGE Any
CABLE COUNT 551-575 CABLE 1

MAP LINES R4-8 EXCHANGE Any
CABLE COUNT 576-600 CABLE 1



EXAMPLE: ASSUME THE HOUSING CAN ACCOMMODATE 3 COLUMNS (FRAME 1, 2, 3) AND 18 ROWS (BLOCK 1, 2, ... 18) OF MODULES. EACH MODULE CAN ACCOMMODATE 25 PAIRS (BINDING POSTS) OF CONDUCTORS. PAIR NUMBER 67 WOULD APPEAR AT THE FOLLOWING ADDRESS: FRAME 1 – BLOCK 3 – BINDING POST 17, OR 1-3-17.

REA TE&CM 118

THE HOUSING ADDRESS SYSTEM

SAI FEEDER RECORD

BLOCK 1 - FEEDER -

BP	LP	X TO DIST. BP	X TO CARRIER	X TO CONC	CA. PAIR
1	8	1-7-19			526
2		1-8-6			527
3		1-11-1			528
4		1-10-7			529
5		1-10-14 LLE 6			530
6		1-7-7			531
7		1-13-1	SYS 1		532
8					533
9					534
10					535
11					536
12					537
13					538
14					539
15					540
16					541
17					542
18					543
19					544
20					545
21					546
22					547
23					548
24					549
25					550

EXCHANGE Any
S.A.I. NO X
FEEDER CABLE AND COUNT 1,501-550 CABLE

BLOCK 2 - FEEDER -

BP	LP	X TO DIST. BP	X TO CARRIER	X TO CONC	CA. PAIR
					551
					552
					553
					554
					555
					556
					557
					558
					559
					560
					561
					562
					563
					564
					565
					566
					567
					568
					569
					570
					571
					572
					573
					574
					575

BLOCK 3 - FEEDER -

BP	LP	X TO DIST BP	X TO CARRIER	X TO CONC	CA. PAIR
					576
					577
					578
					579
					580
					581
					582
					583
					584
					585
					586
					587
					588
					589
					590
					591
					592
					593
					594
					595
					596
					597
					598
					599
					600

EXCHANGE Any
S.A.I. NO X
FEEDER CABLE AND COUNT 1,551-600 CABLE

X1564

EXHIBIT E

REA TE&CM 118

S.A.I NO _____ CABLE _____

EXCHANGE _____ FEEDER CABLE AND COUNT _____

CA. PAIR	B P	L P	X TO DIST BP	X TO CARRIER	X TO CONC	CA. PAIR	B P	L P	X TO DIST BP	X TO CARRIER	X TO CONC	CA. PAIR	B P	L P	X TO DIST BP	X TO CARRIER	X TO CONC	CA. PAIR	B P	L P	X TO DIST. BP	X TO CARRIER	X TO CONC
01						26						51						76					
02						27						52						77					
03						28						53						78					
04						29						54						79					
05						30						55						80					
06						31						56						81					
07						32						57						82					
08						33						58						83					
09						34						59						84					
10						35						60						85					
11						36						61						86					
12						37						62						87					
13						38						63						88					
14						39						64						89					
15						40						65						90					
16						41						66						91					
17						42						67						92					
18						43						68						93					
19						44						69						94					
20						45						70						95					
21						46						71						96					
22						47						72						97					
23						48						73						98					
24						49						74						99					
25						50						75						00					

-DISTRIBUTION-

DR BP	CA. & COUNT	B P	CUSTOMER NAME	ROUTE	MAP NO.	PED. OR POLE NO.	TEL. NO	L P	B O. CAP.	CARRIER SYSTEM CHANNEL
	/01	1								
	/02	2								
	/03	3								
	/04	4								
	/05	5								
	/06	6								
	/07	7								
	/08	8								
	/09	9								
	/10	10								
	/11	11								
	/12	12								
	/13	13								
	/14	14								
	/15	15								
	/16	16								
	/17	17								
	/18	18								
	/19	19								
	/20	20								
	/21	21								
	/22	22								
	/23	23								
	/24	24								
	/25	25								

X1503

FRAME & BLOCK _____

TX; 101-125
EXCHANGE

DIST CABLE & COUNT

EXHIBIT F

Sheet 1 of 4

EXCHANGE Any FRAME & BLOCK 1-6 DIST CABLE & COUNT DX1, 126-150 EXCHANGE FRAME & BLOCK DIST CABLE & COUNT

TO FDR BP	CA. & COUNT	B P	CUSTOMER NAME	ROUTE	MAP NO.	PED OR POLE NO.	TEL. NO	L P	B. O CAP	CARRIER SYSTEM CHANNEL
	126	1								
	127	2								
	128	3								
	129	4								
	130	5								
	131	6								
	132	7								
	133	8								
	134	9								
	135	10								
	136	11								
	137	12								
	138	13								
	139	14								
	140	15								
	141	16								
	142	17								
	143	18								
	144	19								
	145	20								
	146	21								
	147	22								
	148	23								
	149	24								
	150	25								

- DISTRIBUTION -

FDR BP	CA. & COUNT	B P	CUSTOMER NAME	ROUTE	MAP NO	PED. OR POLE NO.	TEL. NO.	L P	B. O. CAP.	CARRIER SYSTEM CHANNEL
	151	1								
	152	2								
	153	3								
	154	4								
	155	5								
	156	6								
-1-6	157	7	Stan Williams	1-4	5-105	425	5446	1		
	158	8								
			Note that pair 157 is jumpered to the feeder binding post at the following address:							
			FRAME 1 BLOCK 1 B, POST 6							
	162	12								
	163	13								
	164	14								
	165	15								
	166	16								
	167	17								
	168	18								
1-1-1	169	19	John Doe	1-4-5	6-10	421	5411	1		
	170	20								
	171	21								
	172	22								
	173	23								
	174	24								
	175	25								

FRAME & BLOCK 1-7

EXCHANGE Any

DIST CABLE & COUNT DX1, 151-175

FRAME & BLOCK

EXCHANGE

DIST CABLE & COUNT

X15

EXCHANGE Any FRAME & BLOCK 1-8 DIST CABLE & COUNT DX1, 176-200 EXCHANGE FRAME & BLOCK DIST CABLE & COUNT

TO FDR BP	CA. & COUNT	B P	CUSTOMER NAME	ROUTE	MAP NO.	PED. OR POLE NO.	TEL. NO	L P	B O. CAP.	CARRIER SYSTEM CHANNEL
	176	1								
	177	2								
	178	3								
	179	4								
	180	5								
-1-2	181	6	Jim Greene	1-4-4	5-100	420	5468	1		
	182	7								
	183	8								
	184	9								
	185	10								
	186	11								
	187	12								
	188	13								
R -13-3	189	14	Bob White	1-4-1	6-22	418	5484	—		SYS 1 CH 3 T-Coil
	190	15								
	191	16								
	192	17								
	193	18								
	194	19								
	195	20								
	196	21								
	197	22								
	198	23								
	199	24								
	200	25								

-DISTRIBUTION-

DR BP	CA. & COUNT	B P	CUSTOMER NAME	ROUTE	MAP NO.	PED. OR POLE NO	TEL. NO.	L P	B. O. CAP.	CARRIER SYSTEM CHANNEL
	201	1								
	202	2								
	203	3								
	204	4								
	205	5								
	206	6								
	207	7								
	208	8								
	209	9								
	210	10								
	211	11								
	212	12								
	213	13								
	214	14								
	215	15								
	216	16								
	217	17								
	218	18								
	219	19								
	220	20								
	221	21								
	222	22								
	223	23								
	224	24								
	225	25								

FRAME & BLOCK 1-9 — FRAME & BLOCK _____ — X1582

RANGE Any — DIST CABLE & COUNT DX1, 201-225 — EXCHANGE — DIST. CABLE & COUNT

EVUTDTT C

EXCHANGE Any FRAME & BLOCK 1-10 DIST CABLE & COUNT DX1, 226-250 EXCHANGE FRAME & BLOCK DIST CABLE & COUNT

TO FDR BP	CA. & COUNT	B P	CUSTOMER NAME	ROUTE	MAP NO	PED OR POLE NO	TEL. NO	L P	B. O CAP	CARRIER SYSTEM CHANNEL
	226	1								
	227	2								
	228	3								
	229	4								
	230	5								
	231	6								
1-1-4	232	7	Pat Jones	4-8	1-21	360	5454	0		
	233	8								
	234	9								
	235	10								
1-13-3	236	11	Bozo Bradley	3	5-114	380	5416	0		
	237	12								
	238	13								
1-1-5	239	14	Sue Swain	3	6-24	373	5488	0		
	240	15								
	241	16								
	242	17								
	243	18								
	244	19								
	245	20								
	246	21								
	247	22								
	248	23								
	249	24								
	250	25								

- DISTRIBUTION -

FDR BP	CA. & COUNT	B P	CUSTOMER NAME	ROUTE	MAP NO.	PED. OR POLE NO.	TEL. NO.	L P	B. O. CAP.	CARRIER SYSTEM CHANNEL
-1-3	251	1	Jim Smith	1	5-32	74	5401	—		
-13-2	252	2	Clyde Brooks	1	4-11	171	5474			
	253	3								
	254	4								
	255	5								
	256	6								
	257	7								
	258	8								
	259	9								
	260	10								
	261	11								
	262	12								
	263	13								
	264	14								
	265	15								
	266	16								
	267	17								
	268	18								
	269	19								
	270	20								
	271	21								
	272	22								
	273	23								
	274	24								
	275	25								

FRAME & BLOCK 1-11

EXCHANGE Any

DIST. CABLE & COUNT DX1, 251-275

EXCHANGE

FRAME & BLOCK

DIST CABLE & COUNT

EXHIBIT F

EXCHANGE Any FRAME & BLOCK 1-12 DIST. CABLE & COUNT DX1, 276-300 EXCHANGE FRAME & BLOCK DIST CABLE & COUNT

TO FDR BP	CA & COUNT	B P	CUSTOMER NAME	ROUTE	MAP NO.	PED OR POLE NO.	TEL. NO.	L P	B. O CAP	CARRIER SYSTEM CHANNEL
	276	1								
	277	2								
	278	3								
	279	4								
	280	5								
	281	6								
	282	7								
	283	8								
	284	9								
	285	10								
	286	11								
	287	12								
	288	13								
	289	14								
	290	15								
	291	16								
	292	17								
	293	18								
	294	19								
	295	20								
	296	21								
	297	22								
	298	23								
	299	24								
	300	25								

OFFICE

LINE EQUIPMENT RECORD

GROUP 1A

10	20	30	40	50	60	70	80	90	00
19 RI 5401	29	39	49	59	69	79	89	99	09
18	28	38	48	58	68 RI 5455	78	88	98	08
17	27	37	47	57	67	77	87	97	07
16	26	36	46 RI 5416	56	66	76	86	96	06
15	25	35	45	55	65	75	85	95	05
14 RI 5454	24	34	44	54 RI 5446	64	74 RI 5488 LLE	84	94	04
13	23	33	43	53	63 RI 5481	73	83	93	03
12	22 RI 5484	32	42	52	62	72	82	92 RI 5495	02
11 RI 5411	21	31	41	51 RI 5474	61	71	81 RI 5481	91	01

NOTES: PROPOSED	NO.	SERVED X1578	NO.
FR - FARM RES			
UR - URBAN RES			
RB - RURAL BUS.			
UB - URBAN BUS.			
OTHER			

REA TE&CM 118

EXHIBIT G

OFFICE

TERMINAL RECORD

GROUP 54XX

10		20		30		40		50		60		70		80		90		00	
19		29		39		49		59		69		79		89		99		09	
18		28		38		48		58		68		78		88	RI	98		08	
														1A-74					
														LLE					
17		27		37		47		57		67		77		87		97		07	
16	RI	26		36		46	RI	56		66		76		86		96		06	
1A-46						1A-54													
15		25		35		45		55	RI	65		75		85		95	RI	05	
								1A-68								1A-92			
14		24		34		44		54	RI	64		74	RI	84	RI	94		04	
								1A-14				1A-51		1A-22					
13		23		33		43		53		63		73		83		93		03	
12		22		32		42		52		62		72		82		92		02	
11	RI	21		31		41		51		61		71		81	RI	91		01	RI
1A-11														1A-81				1A-19	

SERVED	NO.	EQUIPMENT X1529	NO.
FR - FARM RES.		WIRED----------	
UR - URBAN RES.		EQUIPPED----------	
RB - RURAL BUS.			
UB - URBAN BUS.			
OTHER			

REA TE&CM 118

EXHIBIT H

NAME			OFF. CODE	CONN NUMBER	
Sue Swain			266	5488	
CL SVC	MDF NO	FREQ.	L F NO	MAP NO.	L L E
R1		30	1A-74	6-24	6
MAIN STA	RTE NO	CABLE NO	PAIR NO	SAI	CABLE ADD
	3	1	505	X	1-1-5
CXR TYPE	CXR SY #	CH #			
TYPE TEL	I & O WIRE	PROT PI-	BKB	PED #	OWNER
Wall	20'		80'	373	Telco
LP NO	CURRENT	CKT LOSS	CKT NOISE	PWR INFL	IR
8	21 mA	8dB	17dBrnc	80	
DIST CA	ROUTE NO	PAIR NO.	CABLE ADD		
DX-1	3	239	1-10-14		
EXT	TYPE TEL	JACKS	I & O WIRE		OWNER
1	Starlite	3	60'		cust.

DATE REC	CAT	STATION OR REPORT UNIT	TYPE OF REPORT	TIME REC	
TESTED BY	TEST SHOWS			TIME DISP	DISP TO
DISPOS CODE	TROUBLE FOUND · WORK DONE			TIME CLEARED	DATE CLEARED
				AP	
				AP	
				AP	
				AP	
				AP	
				AP	
				AP	
				AP	
				AP	
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				AP	
				AP	
				AP	

LINE AND STATION CARD X1577

REA TE&CM 118

EXHIBIT J

REC		REPORT UNIT	TYPE OF REPORT	TIME REC.	
TESTED BY	TEST SHOWS			TIME DISP.	DISP TO
DISPOS CODE	TROUBLE FOUND - WORK DONE			TIME CLEARED	DATE CLEARED
				A P	
				A P	
				A P	
				A P	
				A P	
				A P	
				A P	
				A P	
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				A P	

LINE AND STATION CARD

SERVICE ORDER
PLANT

ORDER NO. 9-77-1

TYPE SER. ORDER Install

DATE ISSUED	DUE DATE	EXCHANGE	TEL. NO.
8/30/77	9/6/77	Any	5411

-IN-	-OUT-
DIRECTORY NAME: John Doe	DIRECTORY NAME:
DIRECTORY ADDRESS: RR1 Anytown, USA	DIRECTORY ADDRESS:
BILLING ADDRESS: Same	BILLING ADDRESS:
CLASSIFIED LISTING:	CLASSIFIED LISTING:
EXTRA BUS. LISTING RES.:	EXTRA BUS. LISTING RES.:

SERVICE & EQUIP. -IN-	RATE	SERVICE & EQUIP. -OUT-	RATE
R1 - Yellow wall phone			
MILEAGE OR ZONE CHARGE		MILEAGE OR ZONE CHARGE	
TOTAL		TOTAL	

REMARKS

PLANT INFORMATION

STAKING SH. NO. _____ DETAIL MAP NO. 13 Sub. No 6-10 TAX DIST

MDF CABLE _____ PAIR _____ SAI X CABLE ADDRESS 1

DIST. CABLE TERMINAL _____ PAIR 169 CABLE ADDRESS 1

DIST. LINE OR ROUTE 1-4-5 PED OR POLE NO. 421

PARTY POS (FREQ) 1 LINE FINDER 1A-11 CO TE

BUNCHING BLOCK NO. _____ BOOSTER ☐ YES BATT. ☐ NO

BRIDGED TAP ISOLATOR ☐ YES ☐ NO OTHER:

EFFECT. DATE	DATE PASSED	COMPLETED BY:

E Any PREFIX 266 TYPE Comb. LE&VFR EXCHANGE PREFIX TYPE

LINE TREATMENT

LINE FINDER	CONN. TERM.	CABLE PAIR	CARD NO.	LINE FINDER	CONN. TERM.	CABLE PAIR	CARD NO.	LINE FINDER	CONN. TERM.	CABLE PAIR	CARD NO.	LINE FINDER	CONN. TERM.	CABLE PAIR
			26				51				76			
			27				52				77			
			28				53				78			
			29				54				79			
			30				55				80			
1A74	5488	505	31				56				81			
			32				57				82			
			33				58				83			
			34				59				84			
			35				60				85			
			36				61				86			
			37				62				87			
			38				63				88			
			39				64				89			
			40				65				90			
			41				66				91			
			42				67				92			
			43				68				93			
			44				69				94			
			45				70				95			
							71				96			
							72				97			
							73				98			
							74				99			
							75				100			

X1580

EXCHANGE PREFIX TYPE

LINE TREATMENT

EXCHANGE PREFIX TYPE

CARD NO	LINE FINDER	CONN TERM.	CABLE PAIR	CARD NO	LINE FINDER	CONN TERM	CABLE PAIR	CARD NO	LINE FINDER	CONN TERM	CABLE PAIR	CARD NO	LINE FINDER	CONN TERM	CABLE PAIR
1				26				51				76			
2				27				52				77			
3				28				53				78			
4				29				54				79			
5				30				55				80			
6				31				56				81			
7				32				57				82			
8				33				58				83			
9				34				59				84			
10				35				60				85			
11				36				61				86			
12				37				62				87			
13				38				63				88			
14				39				64				89			
15				40				65				90			
16				41				66				91			
17				42				67				92			
18				43				68				93			
19				44				69				94			
20				45				70				95			
21				46				71				96			
22				47				72				97			
23				48				73				98			
24				49				74				99			
25				50				75				100			

GE PREFIX TYPE EXCHANGE PREFIX TYPE

C. O. CARRIER RECORD REA TE&CM 118

PAGE 1 OF _____

SYS NO	CHAN. 1		CHAN. 2		CHAN. 3		CHAN. 4		CHAN. 5		CHAN. 6		CHAN 7		CHAN. 8		REMARKS
	LF	CONN	LF	CONN	LF	CONN.	LF	CONN.	LF	CONN	LF	CONN	LF	CONN.	LF	CONN	
1	1A-46	5416															

Any 44 401-600

BAY #
EXCHANGE ____________ PREFIX
CABLE COUNT ____________

BAY #
EXCHANGE ____________ PREFIX
CABLE COUNT ____________

PAIR	SYS NO	CHAN. 1		CHAN. 2		CHAN. 3		CHAN 4		CHAN 5		CHAN. 6		CHAN 7		CHAN 8		REMARKS
		LF	CONN	LF	CONN	LF	CONN	LF	CONN	LF	CONN	LF	CONN	LF	CONN	LF	CONN	

X1581

SAI CARRIER RECORD

REA TE&CM 118

PAGE 1 OF

R	SYS NO	CHAN. 1 LF	CHAN. 1 CONN.	CHAN. 2 LF	CHAN. 2 CONN	CHAN. 3 LF	CHAN. 3 CONN.	CHAN. 4 LF	CHAN. 4 CONN.	CHAN 5 LF	CHAN 5 CONN	CHAN 6 LF	CHAN 6 CONN.	CHAN. LF	CHAN. CONN	CHAN LF	CHAN CONN	X TO DST B P	REMARKS
1	1																		
		1A51	5474															1-11-2	
4				1A46	5484													1-10-11	
																		Drop	CH.3 Loc'd @ Map No. 6-2

X1562

EXCHANGE Any PREFIX 266

BAY # CABLE COUNT DX1, 101-300

EXHIBIT M2

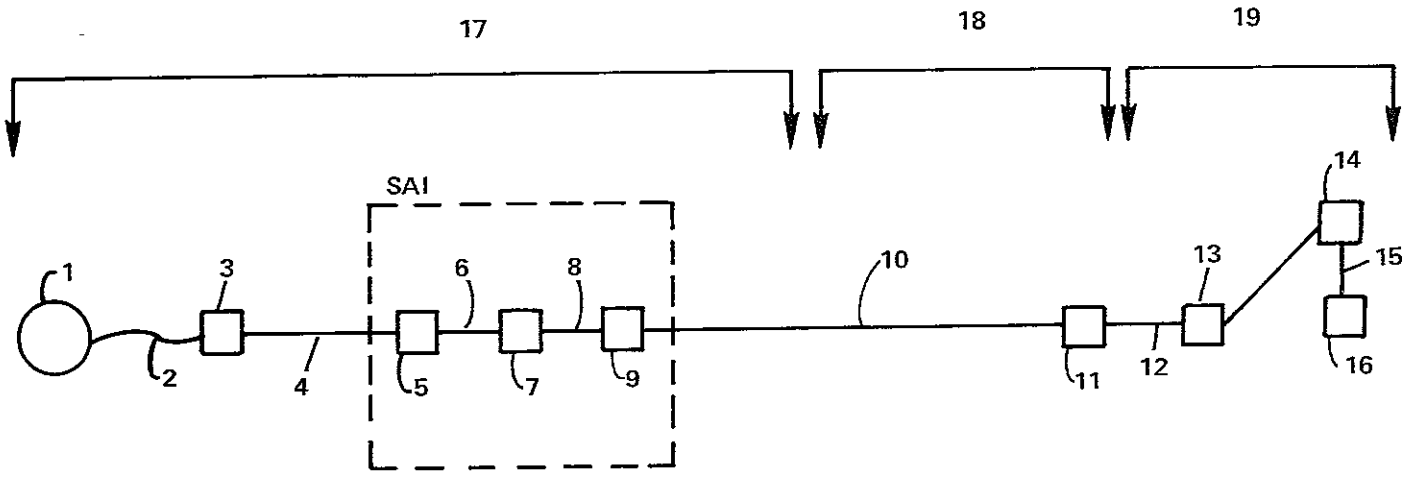
EXCHANGE PREFIX

BAY # CABLE COUNT

BAY #
EXCHANGE ____________ PREFIX
CABLE COUNT ____________

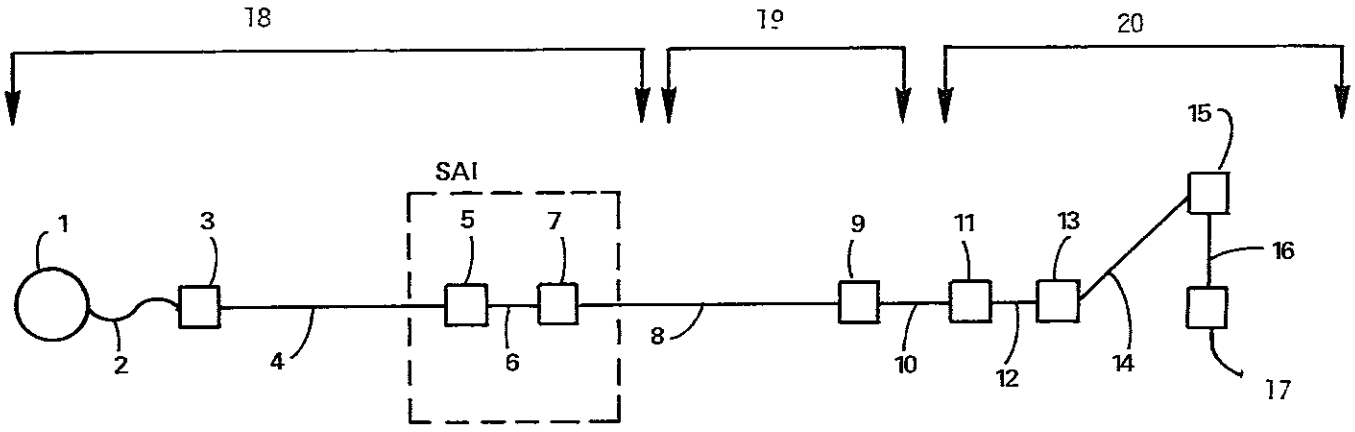
BAY #
EXCHANGE ____________ PREFIX
CABLE COUNT ____________

X TO FEEDER B P	SYS NO	CHAN		CHAN		CHAN.		CHAN.		CHAN.		CHAN.		CHAN.		CHAN		X TO DST B P	REMARKS
		LF	CONN	LF	CONN	LF	CONN	LF	CONN	LF	CONN	LF	CONN	LF	CONN	LF	CONN		



1. CUSTOMER
2. DROP
3. PEDESTAL
4. DISTRIBUTION CABLE
5. DISTRIBUTION CABLE BLOCK & BINDING POST (B.P.)
6. JUMPER
7. CARRIER/CONC. BLOCK & B.P.
8. JUMPER
9. FEEDER BLOCK & B.P.
10. FEEDER CABLE
11. MDF COUNT
12. JUMPER
13. CARRIER/CONC. OFFICE TERMINAL
14. LINE FINDER BLOCK & B.P.
15. JUMPER
16. CONNECTOR BLOCK & B.P.
17. RECORD ON SAI & SUPPLEMENTAL CXR/CONC RECORD
18. RECORD ON MDF CABLE RECORD
19. RECORD ON CO FACILITY RECORDS

BLOCK DIAGRAM – SYSTEM LAYOUT



1. CUSTOMER
2. DROP
3. PEDESTAL
4. DISTRIBUTION CABLE
5. DISTRIBUTION CABLE BLOCK & BINDING POST (B.P.)
6. JUMPER
7. FEEDER BLOCK & B.P.
8. FEEDER CABLE
9. MDF COUNT
10. JUMPER
12. JUMPER
13. VFR
14. JUMPER
15. LINE FINDER
16. JUMPER
17. CONNECTOR BLOCK & D.P.
18. RECORD ON SAI CABLE RECORD
19. RECORD ON MDF CABLE RECORD
20. RECORD ON CO FACILITY RECORDS

EP'T.

M - SYSTEM LAYOUT INCLUDING LINE TREATMENT